

I claim:

1. A device which efficiently generates white light and illuminates objects with a color appearance which is reasonably representative of their color appearance under natural light, said device comprising:

- (a) a three-component, light-generating medium forming an operative part of said device;
- (b) means for connecting said device to a source of predetermined electric potential to energize said medium to a visible-light-generating condition;
- (c) a first component of said medium when energized exhibiting a green laser emission located substantially in the wavelength range of from 515 nm to 540 nm;
- (d) a second component of said medium when energized exhibiting an orange-red laser emission located substantially in the wavelength range of from 600 nm to 625 nm;
- (e) the third component of said medium when energized exhibiting a blue-violet laser emission located substantially in the wavelength range of from 440 nm to 465 nm; and
- (f) the relative proportions of said components of said light-producing medium being such that when their emissions are blended, there is produced white light of predetermined ICI coordinates.

2. The device as specified in claim 1 wherein,

- (a) said first component of said medium when energized exhibiting at least one of (1) a single laser emission within the wavelength range of from 515nm to 540 nm, and (2) a group of laser emissions the principal members of which fall within the wavelength range of from 515 nm to 540 nm;
- (b) said second component of said medium when energized exhibiting at least one of (1) a single laser emission within the wavelength range of from 600 nm to 625 nm, and (2) a group of laser emissions the principal members of which fall within the wavelength range of from 600 nm to 625 nm;

(c) said other remaining component of said medium when energized exhibiting at least one of (1) a single laser emission within the wavelength range of 440 nm to 465 nm, and (2) a group of laser emissions the principal members of which fall within the wavelength range of from 440 nm to 465 nm.

3. A device which efficiently generates white light and illuminates objects with a color appearance which is reasonably representative of their color appearance under natural light, said device comprising:

- (a) a three-component, light-generating medium forming an operative part of said device;
- (b) means for connecting said device to a source of predetermined electric potential to energize said medium to a visible-light-generating condition;
- (c) a first component of said medium when energized exhibiting a green laser emission located substantially in the wavelength range of from 515 nm to 540 nm;
- (d) a second component of said medium when energized exhibiting an orange-red laser emission located substantially in the wavelength range of from 600 nm to 625 nm;
- (e) the third component of said medium when energized exhibiting a blue-violet laser emission located substantially in the wavelength range of from 440 nm to 465 nm; and
- (f) the relative proportions of said components of said light-producing medium being such that when their emissions are blended, there is produced white light of predetermined ICI coordinates with at most only a limited amount of radiations of wavelengths shorter than 430 nm and longer than 630 nm as well as at most only a limited amount of radiations of about 500 nm and about 575 nm.

4. The device as specified in claim 3 wherein

- (a) said first component of said medium when energized exhibiting at least one of (1) a single laser emission within the wavelength range of from 515nm to 540 nm, and (2) a group of laser emissions the principal members of which fall within the wavelength range of from 515 nm to 540 nm;

(b) said second component of said medium when energized exhibiting at least one of (1) a single laser emission within the wavelength range of from 600 nm to 625 nm, and (2) a group of laser emissions the principal members of which fall within the wavelength range of from 600 nm to 625 nm;

(c) said other remaining component of said medium when energized exhibiting at least one of (1) a single laser emission within the wavelength range of 440 nm to 465 nm, and (2) a group of laser emissions the principal members of which fall within the wavelength range of from 440 nm to 465 nm.

5. A device which efficiently generates white light and illuminates objects with a color appearance which is reasonably representative of their color appearance under natural light, said device comprising:

(a) a three-component, light-generating medium forming an operative part of said device;

(b) means for connecting said device to a source of predetermined electric potential to energize said medium to a visible-light-generating condition;

(c) a first component of said medium when energized exhibiting a green laser emission located substantially in the wavelength range of from 515 nm to 540 nm;

(d) a second component of said medium when energized exhibiting an orange-red laser emission located substantially in the wavelength range of from 600 nm to 625 nm;

(e) the third component of said medium when energized exhibiting a blue-violet laser emission located substantially in the wavelength range of from 440 nm to 465 nm; and (f) the relative proportions of said components of said light-producing medium being such that when their emissions are blended, there is produced white light of predetermined ICI coordinates with minimized radiations

in the wavelength ranges of from 465 nm to 515 nm and from 540 nm to 600 nm and with at most only a limited amount of radiations of wavelengths shorter than 430 nm and longer than 630 nm as well as at most only a limited amount of radiations of wavelengths of about 500 nm and about 575 nm.

6. The device as specified in claim 5 wherein,

(a) said first component of said medium when energized exhibiting at least one of (1) a single laser emission within the wavelength range of from 515nm to 540 nm, and (2) a group of laser emissions the principal members of which fall within the wavelength range of from 515 nm to 540 nm;

(b) said second component of said medium when energized exhibiting at least one of (1) a single laser emission within the wavelength range of from 600 nm to 625 nm, and (2) a group of laser emissions the principal members of which fall within the wavelength range of from 600 nm to 625 nm;

(c) said other remaining component of said medium when energized exhibiting at least one of (1) a single laser emission within the wavelength range of 440 nm to 465 nm, and (2) a group of laser emissions the principal members of which fall within the wavelength range of from 440 nm to 465 nm with minimized radiations in the wavelength ranges of from 465 nm to 515 nm and from 540 nm to 600 nm and with at most only a limited amount of radiations of wavelengths shorter than 430 nm and longer than 630 nm as well as at most only a limited amount of radiations of wavelengths of about 500 nm and about 575 nm.

7. A device which efficiently generates white light and illuminates objects with a color appearance which is reasonably representative of their color appearance under natural light, said device comprising:

(a) a three-component, light-generating medium forming an operative part of said device;

(b) means for connecting said device to a source of predetermined electric potential to energize said medium to a visible-light-generating condition;

(c) a first component of said medium when energized exhibiting a green light-emitting-diode emission located substantially in the wavelength range of from 515 nm to 540 nm;

(d) a second component of said medium when energized exhibiting an orange-red light-emitting-diode emission located substantially in the wavelength range of from 600 nm to 625 nm;

(e) the third component of said medium when energized exhibiting a blue-violet light-emitting-diode emission located substantially in the wavelength range of from 440 nm to 465 nm; and

(f) the relative proportions of said components of said light-producing medium being such that when their emissions are blended, there is produced white light of predetermined ICI coordinates.

8. The device as specified in claim 7 wherein,

(a) said first component of said medium when energized exhibiting at least one of (1) a single light-emitting-diode emission within the wavelength range of from 515nm to 540 nm, and (2) a group of light-emitting-diode emissions the principal members of which fall within the wavelength range of from 515 nm to 540 nm;

(b) said second component of said medium when energized exhibiting at least one of (1) a single light-emitting-diode emission within the wavelength range of from 600 nm to 625 nm, and (2) a group of light-emitting-diode emissions the principal members of which fall within the wavelength range of from 600 nm to 625 nm;

(c) said other remaining component of said medium when energized exhibiting at least one of (1) a single light-emitting-diode emission within the wavelength range of 440 nm to 465 nm, and (2) a group of light-emitting-diode emissions the principal members of which fall within the wavelength range of from 440 nm to 465 nm.

9. A device which efficiently generates white light and illuminates objects with a color appearance which is reasonably representative of their color appearance under natural light, said device comprising:

(a) a three-component, light-generating medium forming an operative part of said device;
(b) means for connecting said device to a source of predetermined electric potential to energize said medium to a visible-light-generating condition;

(c) a first component of said medium when energized exhibiting a green Light-emitting-diode emission located substantially in the wavelength range of from 515 nm to 540 nm;

(d) a second component of said medium when energized exhibiting an orange-red Light-emitting-diode emission located substantially in the wavelength range of from 600 nm to 625 nm;

(e) the third component of said medium when energized exhibiting a blue-violet light-emitting-diode emission located substantially in the wavelength range of from 440 nm to 465 nm;
and

(f) the relative proportions of said components of said light-producing medium being such that when their emissions are blended, there is produced white light of predetermined ICI coordinates with at most only a limited amount of radiations of wavelengths shorter than 430 nm and longer than 630 nm as well as at most only a limited amount of radiations of about 500 nm and about 575 nm.

10. The device as specified in claim 9 wherein

(a) said first component of said medium when energized exhibiting at least one of (1) a single light-emitting-diode emission within the wavelength range of from 515nm to 540 nm, and (2) a group of light-emitting-diode emissions the principal members of which fall within the wavelength range of from 515 nm to 540 nm;

(b) said second component of said medium when energized exhibiting at least one of (1) a single light-emitting-diode emission within the wavelength range of from 600 nm to 625 nm, and (2) a group of light-emitting-diode emissions the principal members of which fall within the wavelength range of from 600 nm to 625 nm;

(c) said other remaining component of said medium when energized exhibiting at least one of (1) a single light-emitting-diode emission within the wavelength range of 440 nm to 465 nm, and (2) a group of light-emitting-diode emissions the principal members of which fall within the wavelength range of from 440 nm to 465 nm.

11. A device which efficiently generates white light and illuminates objects with a color appearance which is reasonably representative of their color appearance under natural light, said device comprising:

(a) a three-component, light-generating medium forming an operative part of said device;

(b) means for connecting said device to a source of predetermined electric potential to energize said medium to a visible-light-generating condition;

(c) a first component of said medium when energized exhibiting a green light-emitting-diode emission located substantially in the wavelength range of from 515 nm to 540 nm;

(d) a second component of said medium when energized exhibiting an orange-red light-emitting-diode emission located substantially in the wavelength range of from 600 nm to 625 nm;

(e) the third component of said medium when energized exhibiting a blue-violet light-emitting-diode emission located substantially in the wavelength range of from 440 nm to 465 nm; and

(f) the relative proportions of said components of said light-producing medium being such that when their emissions are blended, there is produced white light of predetermined ICI coordinates with minimized radiations in the wavelength ranges of from 465 nm to 515 nm and from 540 nm to 600 nm and with at most only a limited amount of radiations of wavelengths shorter than 430 nm and longer than 630 nm as well as at most only a limited amount of radiations of wavelengths of about 500 nm and about 575 nm.

12. The device as specified in claim 11 wherein,

(a) said first component of said medium when energized exhibiting at least one of (1) a single light-emitting-diode emission within the wavelength range of from 515nm to 540 nm, and (2) a group of light-emitting-diode emissions the principal members of which fall within the wavelength range of from 515 nm to 540 nm;

(b) said second component of said medium when energized exhibiting at least one of (1) a single light-emitting-diode emission within the wavelength range of from 600 nm to 625 nm, and (2) a group of light-emitting-diode emissions the principal members of which fall within the wavelength range of from 600 nm to 625 nm;

(c) said other remaining component of said medium when energized exhibiting at least one of (1) a single light-emitting-diode emission within the wavelength range of 440 nm to 465 nm, and (2) a group of light-emitting-diode emissions the principal members of which fall within the wavelength range of from 440 nm to 465 nm with minimized radiations in the wavelength ranges of

from 465 nm to 515 nm and from 540 nm to 600 nm and with at most only a limited amount of radiations of wavelengths shorter than 430 nm and longer than 630 nm as well as at most only a limited amount of radiations of wavelengths of about 500 nm and about 575 nm.